

REMARKS

The present amendment is prepared in accordance with the new revised requirements of 37 C.F.R. § 1.121. A complete listing of all the claims in the application is shown above showing the status of each claim. For current amendments, inserted material is underlined and deleted material has a line therethrough.

Applicants appreciate the thoroughness with which the Examiner has examined the above-identified application. Reconsideration is requested in view of the amendments above and the remarks below.

The Examiner has indicated that allowability of claims 16 and 17 is withdrawn in view of the newly discovered references to solder removal with a water jet.

Claims 16 and 17 have now been rejected under 35 USC 102(a) as being anticipated by Black et al. (U.S. Patent No. 6,119,325).

Black et al. is cited to teach an apparatus for separating electronic components joined by rows of solder interconnections comprising securing means (33) to hold an assembly having at least two components (32, 30) joined by a plurality of solder interconnections in a row by row array (34) having a first thickness, the high powered water jet cutting element (36) having a thickness less than the thickness of the solder elements (38) and positioning and driving means to

position and advance the water jet cutting element adjacent one of the solder rows (Fig. 3 and col. 2, lines 15-50). The Examiner acknowledges that although not shown nor disclosed, a separating means of some type is inherently present to remove the separated component for polishing or frontside use (Fig. 2, col. 2, lines 51-59).

Applicants have amended claims 16 and 17 to further define the invention. The claims have been amended to indicate that the water jet cutting element extends across a row of solder interconnections and that the element has a plurality of water jet openings spaced along the front edge of the element. When activated, the plurality of water jets coming from the openings in the cutting element, engage and simultaneously cut through each solder connection in the row and severs the entire row of solder interconnections at one time. This step is then continued for the remaining rows of solder interconnections to cut and sever all the rows of solder interconnections. Basis for the amendment may be found, for example, in drawing Fig. 3D which shows the water jet cutting element 22 spaced across the width of the cutting device and a plurality of water jets 24 coming out of the front edge of the cutting element 22.

When the cutting element 22 is placed adjacent a row of solder interconnections, the plurality of water jets will sever each of the solder interconnections in the row simultaneously and then the cutting element can be

advanced toward the next row until all the solder interconnections in each row have been severed.

The Black et al. reference shows a spray device 36 with a narrow high-precision water stream 38. It is clear that Black et al. does not show a plurality of water streams to sever a row of solder interconnections simultaneously and it is respectfully submitted that the claims as now amended are properly allowable over Black et al.

Claims 18-21 have been rejected under 35 USC 103(a) as being unpatentable over Black et al. (U.S. Patent No. 6,119,225) in view of Romanini (U.S. Patent No. 6,305,261).

Black et al. is cited as above and the Examiner acknowledges that the high power and the thickness of the water cutting element are not disclosed in Black et al.

Romanini is cited to teach a small tool (hand held) for cutting through soft materials such as foams, plastics, rubber and food products with a high powered water jet wherein the water jet has a fluid pressure of 22,000 to 45,000 psi and comes out of an orifice having a size of 0.004 to 0.020 inches which presumably defines the thickness of the water stream (col. 5, lines 12-24).

The Examiner concludes it would have obvious to one of ordinary skill in the art at the time of the invention to employ known cutting pressures such as 20,000 psi to form a jet having a thickness smaller than the size range of

conventional solder ball or bump interconnects (.004-.020 inches or about 100 to about 500 microns) and thereby provide sufficient precision to break through the coupling material without harming the device (Black, col. 1, lines 45-56 and col. 2, lines 46-56).

Claims 18-21 are directed to preferred embodiments of Applicants' invention in claims 16 and 17 and it is respectfully submitted are properly allowable over the references since claims 16 and 17 are allowable as discussed above.

In any event, Romanini does not show Applicants' invention but merely shows a cutting apparatus for cutting using a pressurized jet of fluid from a high pressure fluid source. The hand-held tool provides a single high pressure stream and does not show a plurality of high pressure streams from a cutting element as now claimed in Applicants' invention. Accordingly, Ramanini does not supply the deficiencies of Black et al. with regard to the crux of the invention which is directed to severing a row of solder interconnections simultaneously and then moving to the next row until all the solder connections are severed.

Applicants have reviewed the prior art made of record and not relied upon and it is respectfully submitted that the references do not teach Applicants' invention whether taken singly or in any proper combination thereof. The patents are Slack et al. (U.S. Patent No. 4,602,733); Spigarelli et al. (U.S. Patent No. 5,220,147); Hyun (U.S. Patent No. 4,896,019); Hembree (U.S. Patent No.

6,267,650); Oglesby et al. (U.S. Patent No. 4,785,793); Michel (U.S. Patent No. 3,903,581); and Waller et al. (U.S. Patent No. 5,229,575).

It is respectfully submitted that the application has now been brought into a condition where allowance of the case is proper. Reconsideration and issuance of a Notice of Allowance are respectfully solicited. Should the Examiner not find the claims to be allowable, Applicants' attorney respectfully requests that the Examiner call the undersigned to clarify any issue and/or to place the case in condition for allowance.

Respectfully submitted,

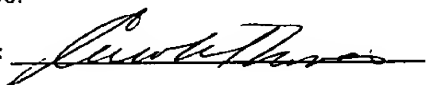


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